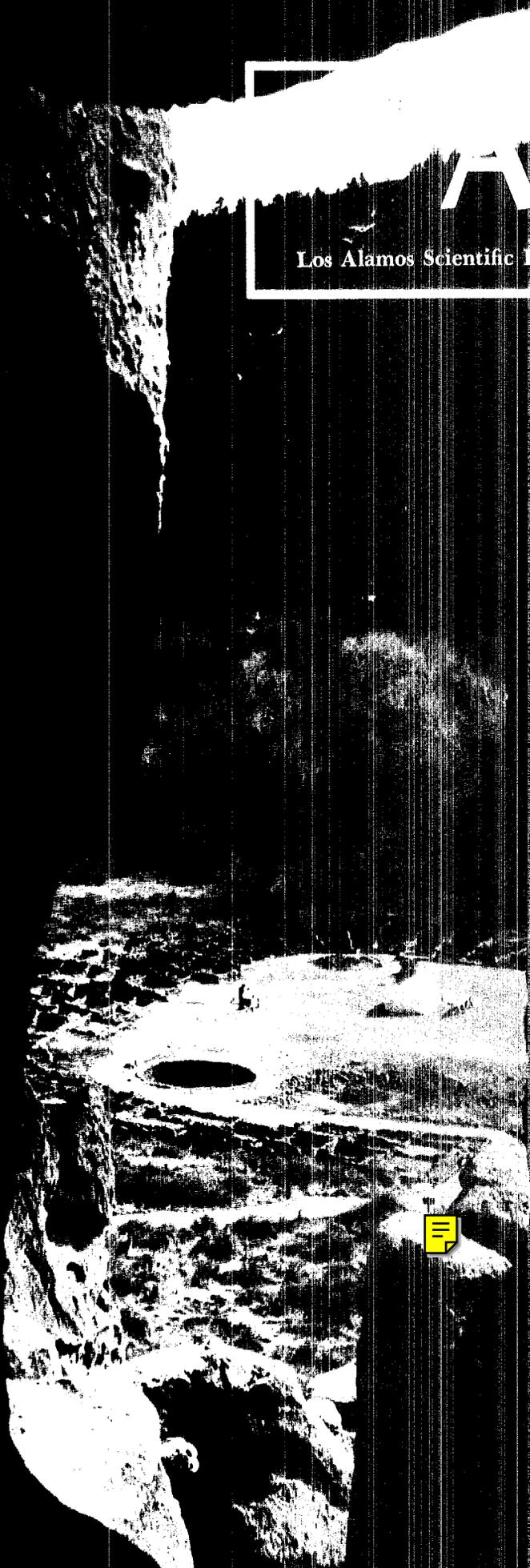


ATOM

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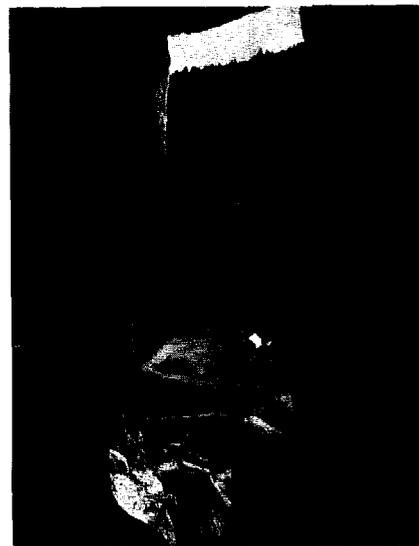
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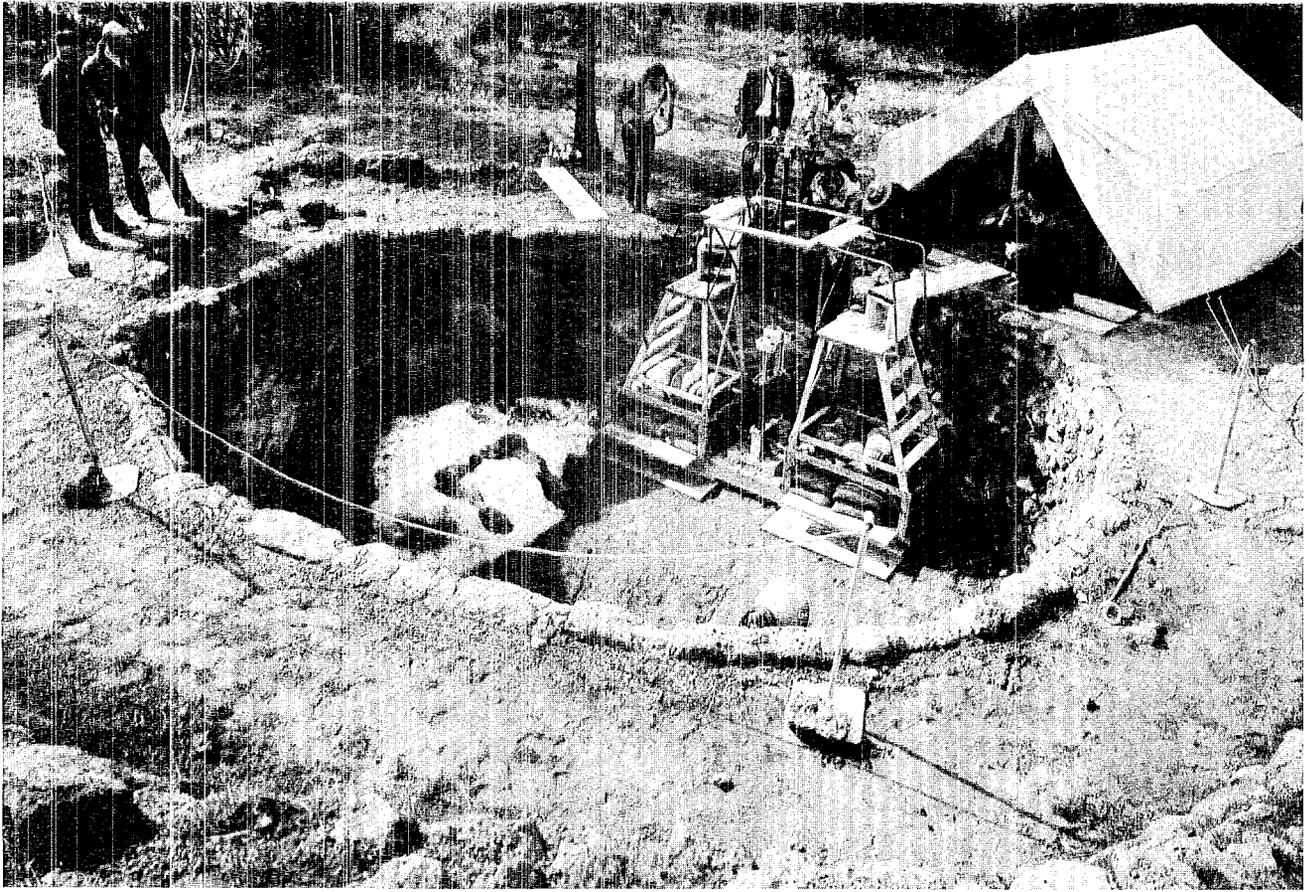
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COVER:

No one was camping in the plaza of the Tyuonyi ruin at Bandelier National Monument. The tent, seen in the cover photograph taken by ISD-7 Photographer Bill Jack Rodgers, served to house control instruments for operation of the subterrene. LASL scientists, at the request of the National Park Service, used the rock-melting device to bore some drainage holes in the ruins at Bandelier. For more information read the story which begins on page one.



The first of a series of holes melted with the subterrene at Bandelier National Monument was in the floor of a kiva. In addition to members of Group Q-23 who operated the subterrene, many visitors from the National Park Service were present.

The First Practical Application of the Subterrene

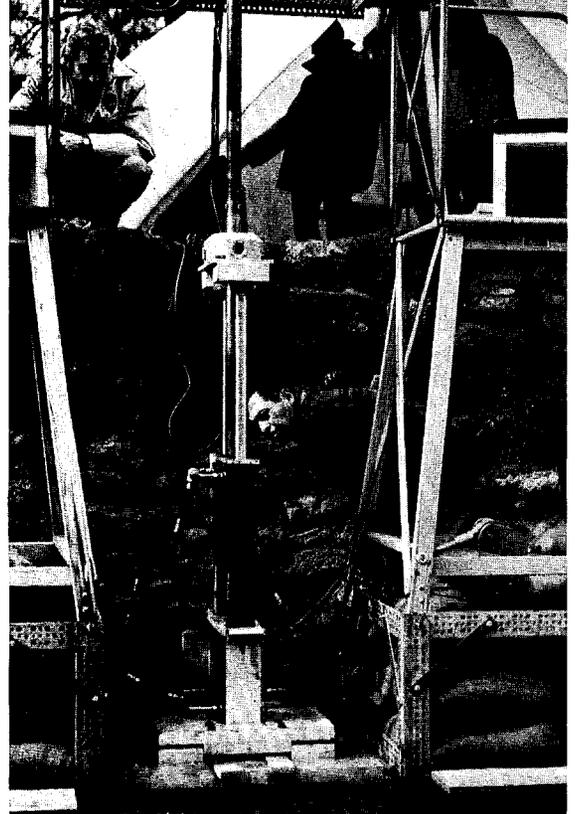
The subterrene, a rock-melting penetrator being developed at the Los Alamos Scientific Laboratory, has been used to bore drainage holes in ruins at Bandelier National Monument, near Los Alamos. The event marks the first practical application of the device, which has been under development at LASL for about three years.

The subterrene used at Bandelier is a portable unit built with funds provided by the National Science Foundation. While, to date, it has been operated at Bandelier by Group Q-23's Test Section, headed by Ed Williams, a National Park Service team will eventually be trained in its use. The portable unit will then be loaned to the NPS for more drainage-control service at Bandelier and at other of the many historic sites for which the NPS is responsible.

In all, the LASL contingent bored

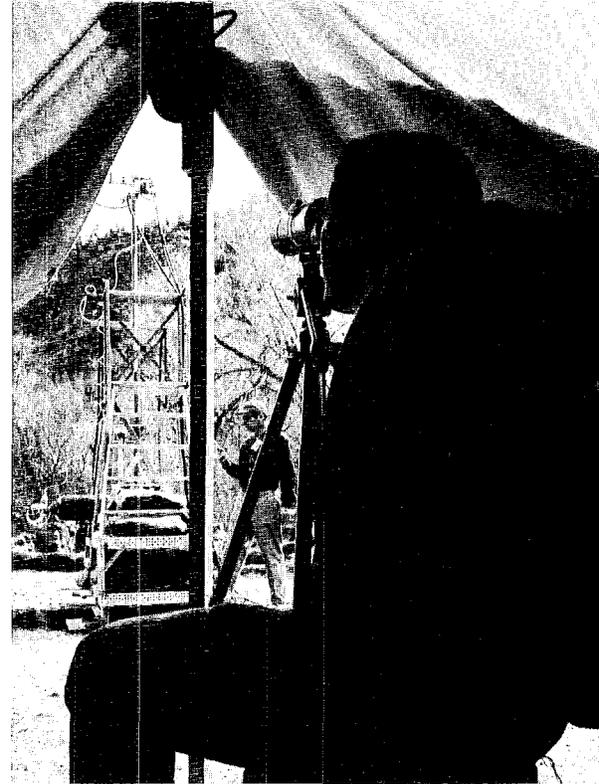
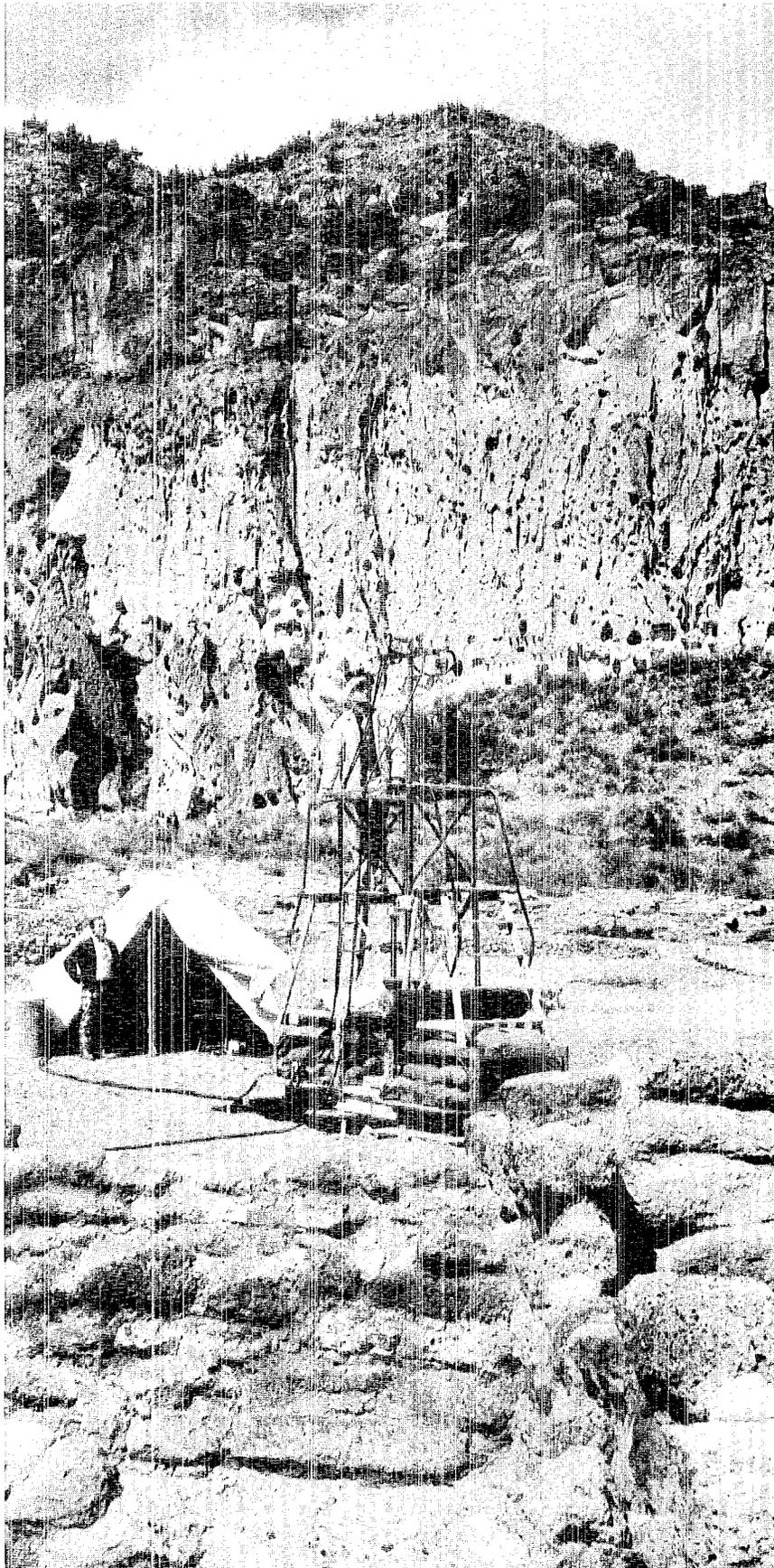
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Ray Olivas, Q-23, checks subterrene operation in the bottom of the kiva. Above are Larry Hupke and Jim Griggs, both of Q-23.



Visitors to Bandelier National Monument stop to read information about the subterrene at Tyuonyi ruin. In background, Ed Williams, Q-23 Test Section leader, checks melting operation.





Olivas checks melting rate by viewing measuring stick on stem of subterrene through telescope.

View from the ground at Tyuonyi where LASL scientists used the subterrene to bore three drainage holes close together.



The view from the top of trail at Bandelier was of the old and new—the old Tyuonyi ruin and the new subterrene.

five holes at Bandelier to drain water that might otherwise erode the ruins. All were vertical holes between six and 12 feet deep and two inches in diameter.

“There is a lot of loose rock below the surface here at Bandelier,” said Williams. “It seems that you only need to bore a hole into these areas and surface water drains away quite rapidly.”

The first of the drainage holes melted was in a floor of a kiva, near the Rainbow House ruin, just off the main road entering Bandelier National Monument. The second

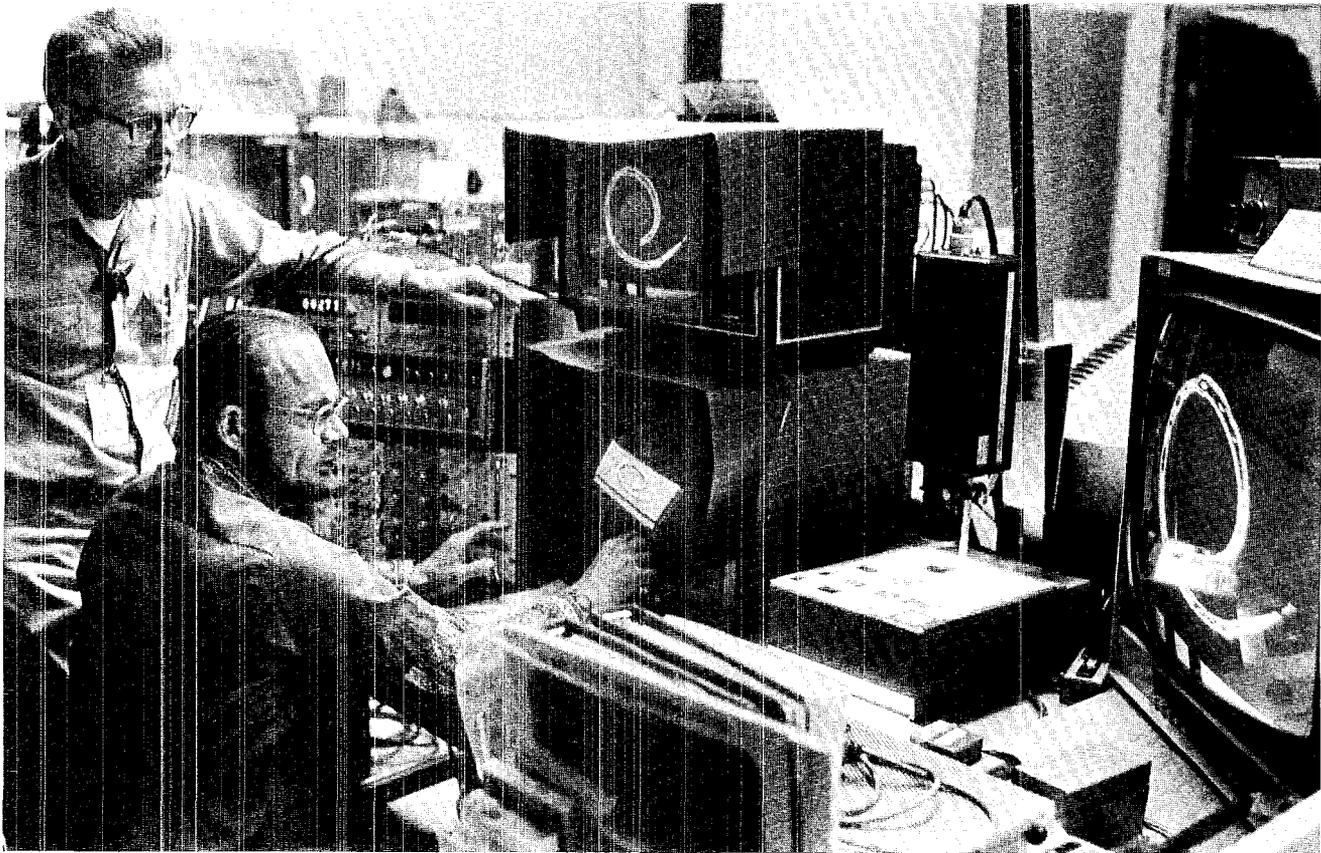
hole was bored in a room at the Rainbow House. The remaining three holes were melted in the center of the circular ruin Tyuonyi, one of the most popular sites at Bandelier.

Although the only evidence of the subterrene’s presence in the kiva, and at the Rainbow House, is a small hole in the ground, the bores in the Tyuonyi ruin will not be visible. Three subterrene holes, close enough together to fit inside a 55-gallon drum, were melted in a shallow dugout, prepared by National Park Service personnel. “A

drum will be slipped over the group of holes,” said Lin Jackson, NPS supervisor at the monument. “There will be openings in the sides of the drum to allow surface water to enter the drainage holes, but the top of the drum will be covered over with soil so the visitor will never see the holes in Tyuonyi’s plaza.

“We haven’t had any long-term experience yet, but the subterrene is doing something for which there has long been a need. It’s portable, lightweight and almost motionless. It appears to be just the thing for some of our drainage problems.”

Detection of Trichinellae Infection In American Porkers--On the Hoof



Dale Holm, H-6 group leader, observes operation of electronic image-enhancement techniques being developed by John Seagrave, P-DOR. Images on screens are all of the same trichina. Differences are that the screen at right shows black and white image while screen at top center shows trichina in color. Below color screen is a three-dimensional black and white display.

The United States is not among those countries that have effectively controlled trichinosis. This parasitic disease, generally passed on to humans by infected pork, is not considered to be a serious public health hazard, but it is an export problem since "trichinosis-free" countries will not buy uncooked American pork.

The U.S. Department of Agriculture, aware of the difficulties associated with exporting pork, has sponsored a project to upgrade methods of detecting trichinosis in hogs. Nearly 80 million hogs are slaughtered each year in the United States.

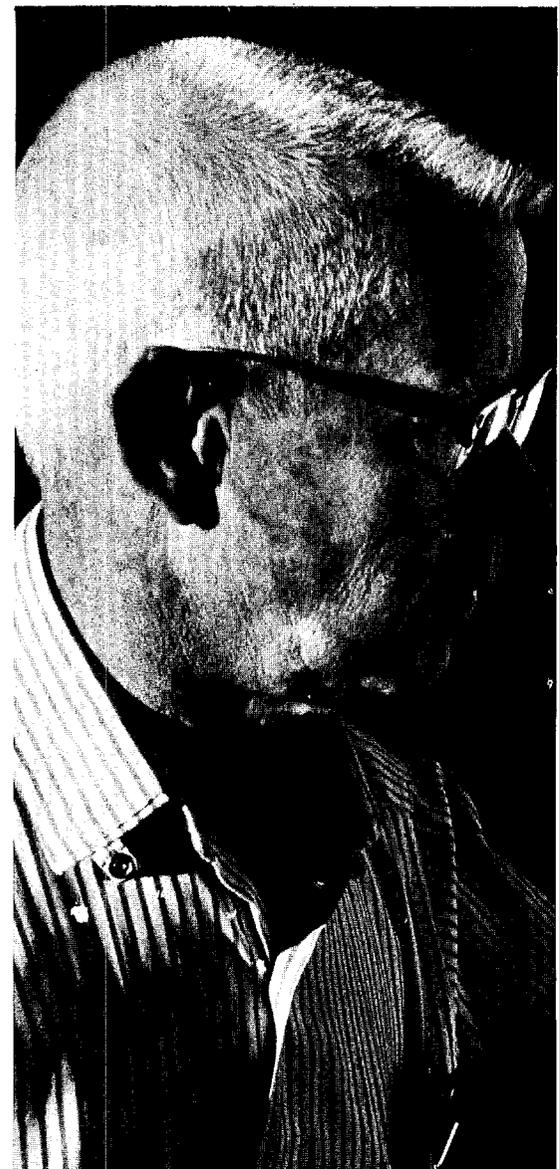
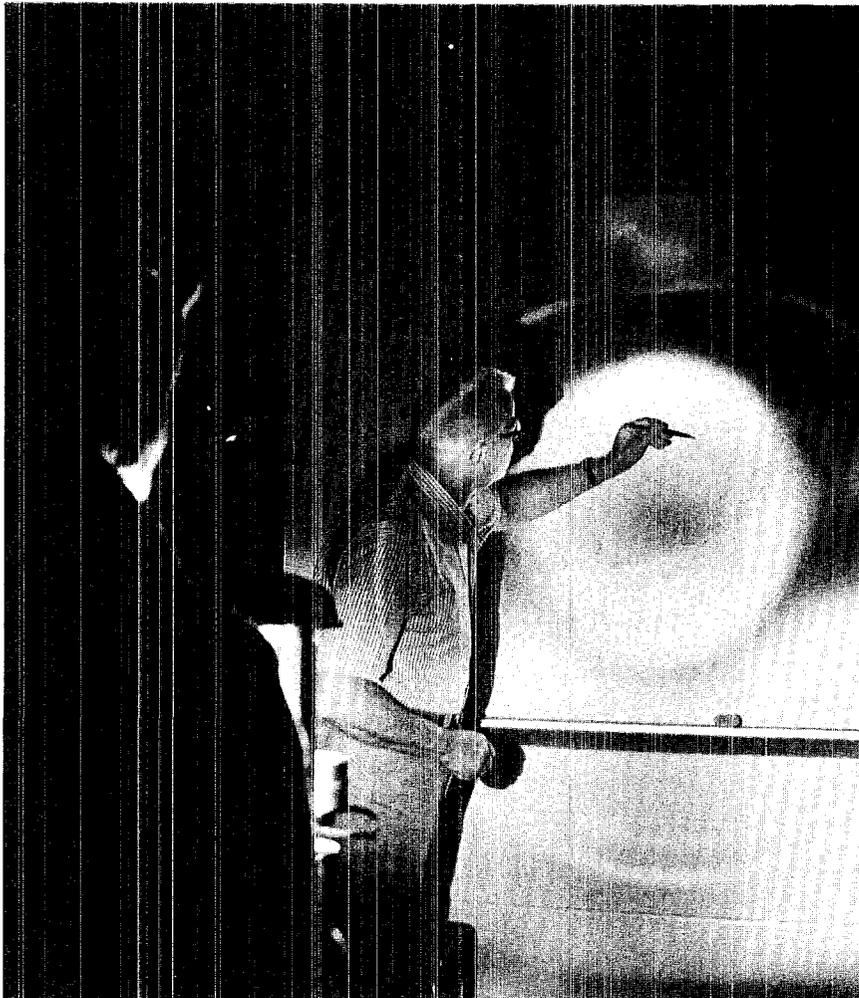
Through an agreement between the USDA and the Atomic Energy Commission, scientists at the Los Alamos Scientific Laboratory are de-

veloping new, rapid, on-line, automated methods for the detection of trichinosis in hogs that would operate economically and at speeds equivalent to the high rate of slaughter.

"We're approaching the problem by developing four methods for detecting trichinosis in swine at the slaughterhouse," said Dale Holm, H-6 group leader, who is responsible for coordinating USDA projects at the Laboratory. "Two are physical methods and two are serological. The physical methods are remarkably simple, rapid and inexpensive, and they have been successfully tested at a slaughterhouse. The serological methods aren't as well developed, although they are very attractive to the USDA because

continued on page 7

Right, Bob Payne, H-6, shows thin, almost-transparent sample produced by squeezing pea-sized piece of meat in a metallurgical sample press. After pressing, the sample can be projected on a screen, below, just as a film transparency. In the first laboratory versions of the projection method, the pressed sample was mounted in a standard two-inch photographic slide mount and projected in a standard slide projector. Some steps are now being combined to cut down detection time. Below right, in appearance, image produced by using the projection method looks much like an aerial map. Paul Giles, H-6, points to one of several trichinella cysts.



it appears that they can be used to detect several different animal diseases simultaneously."

The physical methods are being developed by Paul Giles and Bob Payne, both of II-6, and John Seagrave, P-DOR, who is responsible for this part of the project.

In one, the projection method, a pea-sized piece of meat and a drop of glycerine are squeezed between two plates in a metallurgical sample press until the meat spreads out into a very thin, almost-transparent sample. This sample is then projected on a screen. In the projected image trichinellae cysts are easily seen.

In the digestion method, a meat sample of the same size used in the projection method is blended in a solution that is chemically similar

to digestives which process food in the stomach. After blending, the suspended material may be observed either under a low-power microscope or by projecting it on a screen. Digestive-type solutions successfully used in this method include raw pineapple juice, trypsin, meat tenderizer and dilute laundry bleach. The blender is a modified kitchen machine whose blades have been blunted to reduce the number of trichinellae cut up during the blending operation.

Even with the laboratory setups used in development and testing, scientists have been able to render "yes and no" decisions in about three minutes with either the projection or digestion methods. While either of these methods is rapid enough to keep pace with the rate

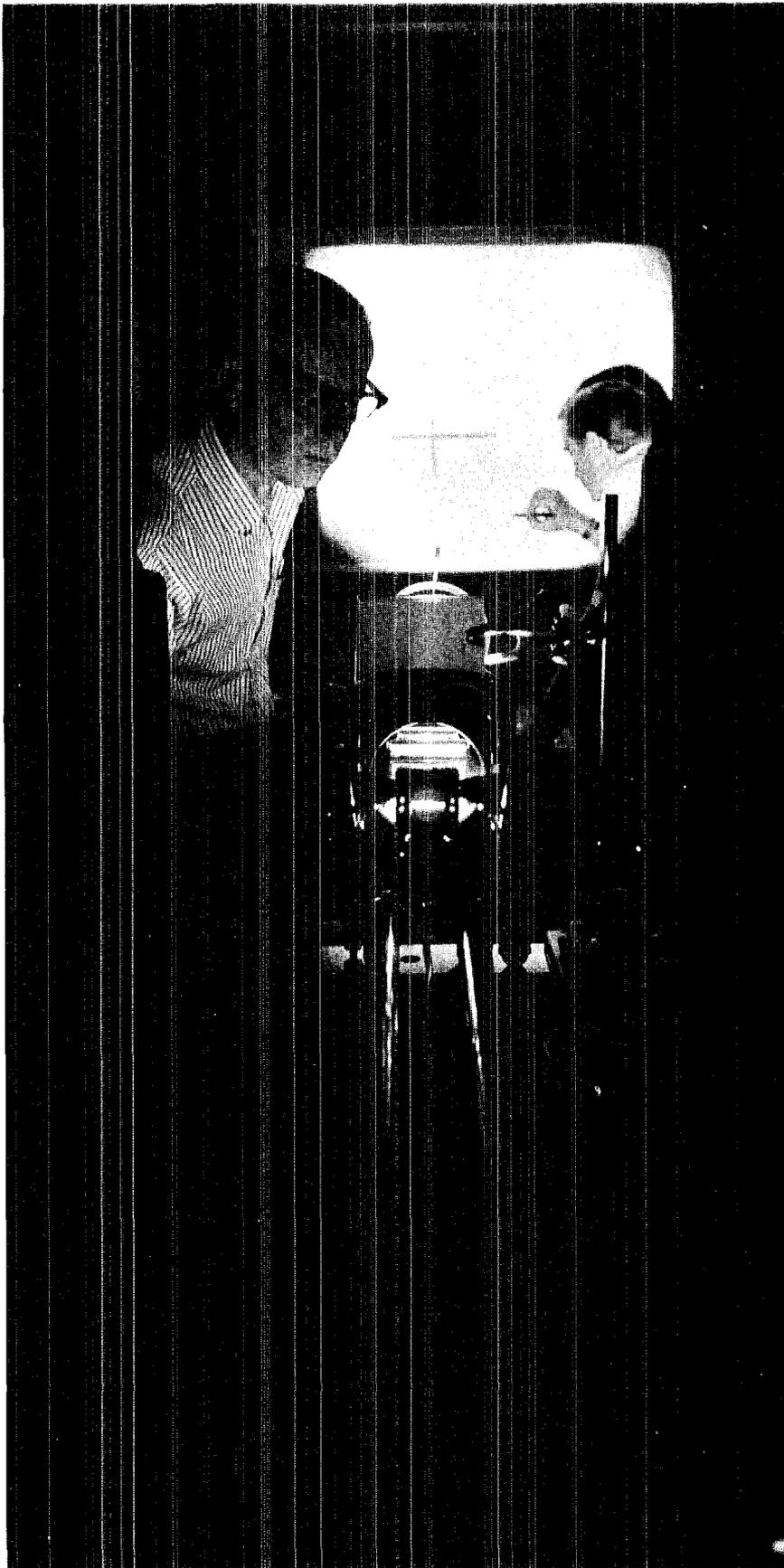
of slaughter, their operation would become still faster, simpler and less expensive when fully automated.

In addition to automating mechanical procedures, methods of automating observance of trichinellae and other infecting organisms are being investigated by Seagrave. These include several electronic and optical pattern-recognition and image-enhancement techniques that might be used in conjunction with either the physical or serological methods being developed.

The serological tests are known by the acronyms SAFA (Soluble Antigen-Fluorescent Antibody) and ELA (Enzyme Labeled Antibody). While these tests are expected to be slower (20 to 30 minutes when automated) than the physical detec-

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In the digestion method, trichinellae can be seen easily either by viewing digestion material under a microscope or by observing a projected image of it on a screen as demonstrated by Giles and Payne.

tion methods, they are still attractive to USDA officials because the same chemical processings are suitable for screening for many different diseases.

SAFA tests have been used clinically for several years to detect various diseases in humans and animals. However, these tests have never been used to detect trichinosis in hogs. The test is being developed for the trichinosis project by Elva Clinard, H-10.

The ELA test is being developed by George Saunders, H-6. It is a totally new approach to the detection of animal and human diseases, and is expected to be the more sensitive of the two serological tests. "It should also be useful in detecting drugs in animals," said Saunders. "It's against the law to slaughter animals right after they've been given certain drugs. There is a waiting period to allow drugs such as sulfa, penicillin or estrogens to clear an animal's system. People who are allergic to, say, penicillin or sulfa, could otherwise have a reaction from eating the meat."

The serological tests are based on the detection of antibodies that an animal's system makes to combat foreign agents or antigens that enter the body. These antibodies are discriminative in that one type of antibody will not be effective against any antigen except the one that stimulated its formation. Therefore, with the serological methods, a disease is identified by identifying its antibody.

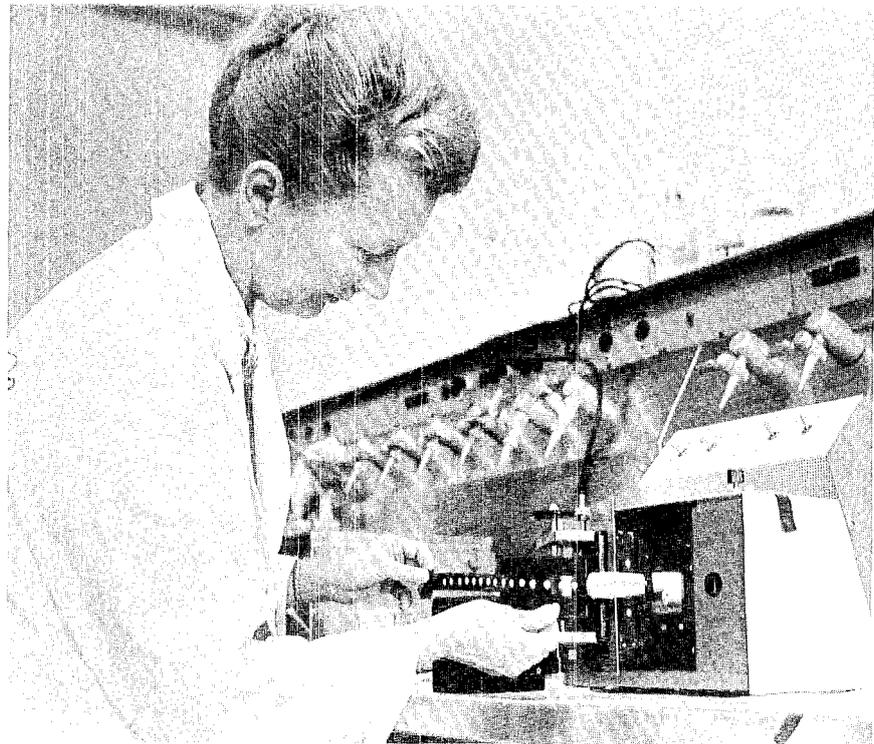
Both the SAFA and ELA tests are used to detect the presence of an antibody in blood serum from a suspect animal. A drop of serum from

the animal is added to a cellulose-acetate disk which has been treated with the antigen of a certain disease, such as trichinosis. If the animal is diseased, the antigen-treated disk will collect antibodies and retain them after the serum is washed off. Another substance is added to the disk which allows detection of any antibodies bound to the antigen on the disk.

In the SAFA test, this substance has a fluorescent dye associated with it. The presence or absence of trichinosis antibodies is determined by shining an ultraviolet light on the disk and measuring the amount of fluorescent light given off. Bright fluorescence indicates the presence of antibodies to the disease.

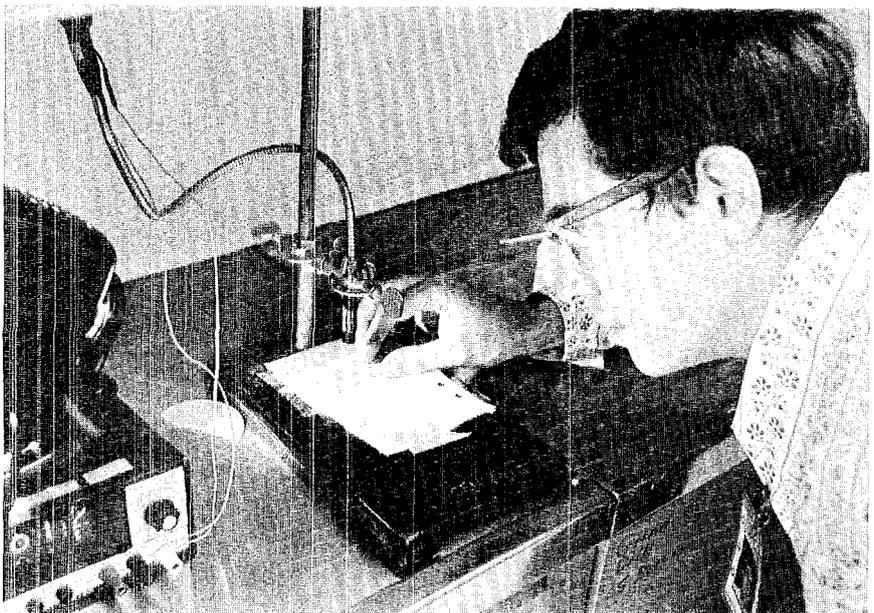
In the ELA test, the substance has an enzyme associated with it. There is an extra step in which the enzyme catalyzes another chemical to give the disk a brown color if antibodies to the disease are present. The ELA test appears to have the advantage of being able to detect fewer antibodies than the SAFA test, so that new or lesser infections can be detected easier.

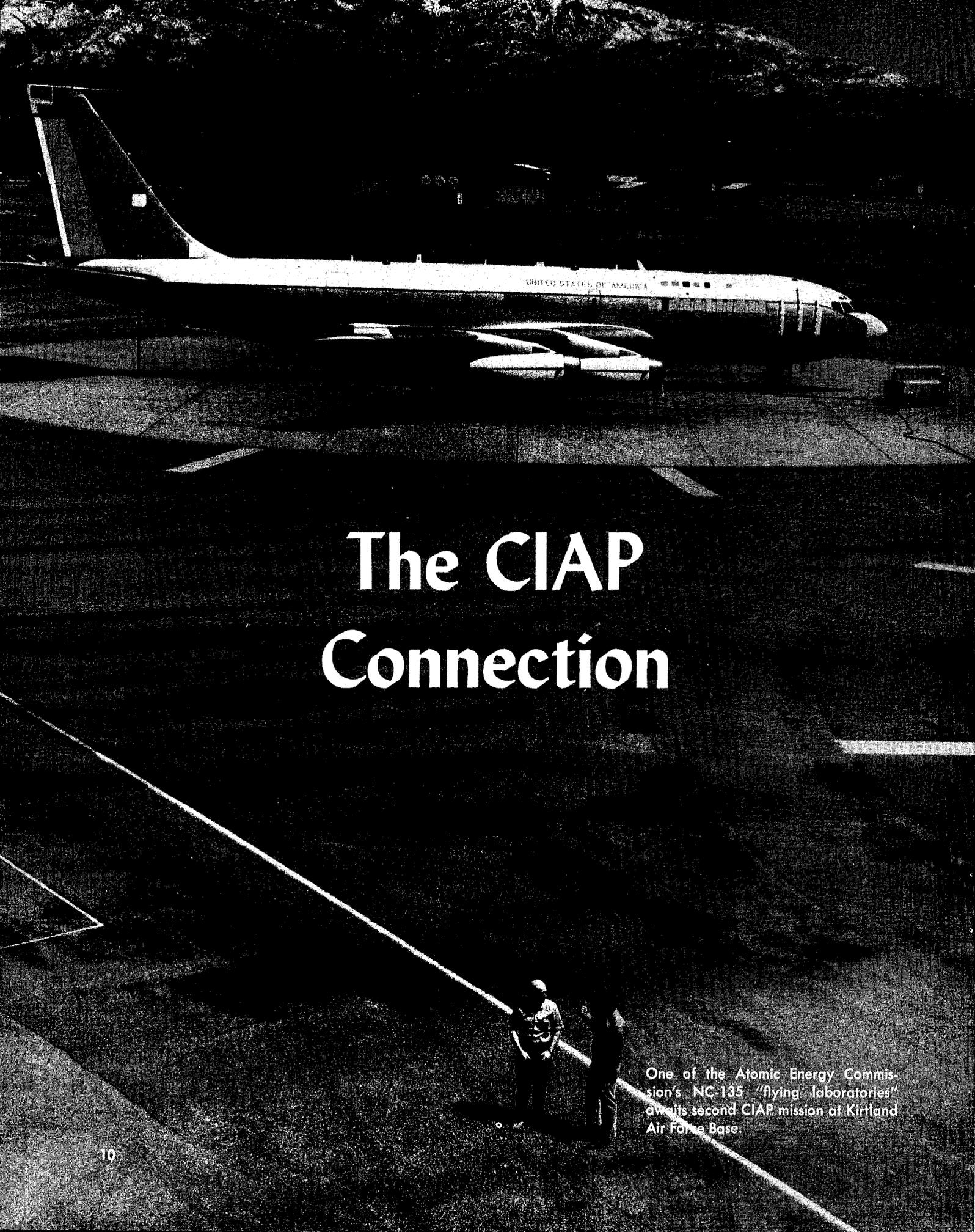
Each of the four trichinosis-detection methods will be developed to the point where a valid judgment can be made as to which method or combination of methods is best suited for employment at slaughterhouses. In addition, experiments will be conducted to determine the potential of those methods that appear appropriate for the detection of other animal diseases of economic importance to the livestock industry.



Elva Clinard, H-10, who is developing the SAFA serological test, loads several cellulose-acetate disks, mounted on black tape, into a fluorometer. The fluorometer is used to measure the intensity of fluorescent light emitted by each disk. If a suspect hog has trichinosis, the disk treated with its blood serum will fluoresce.

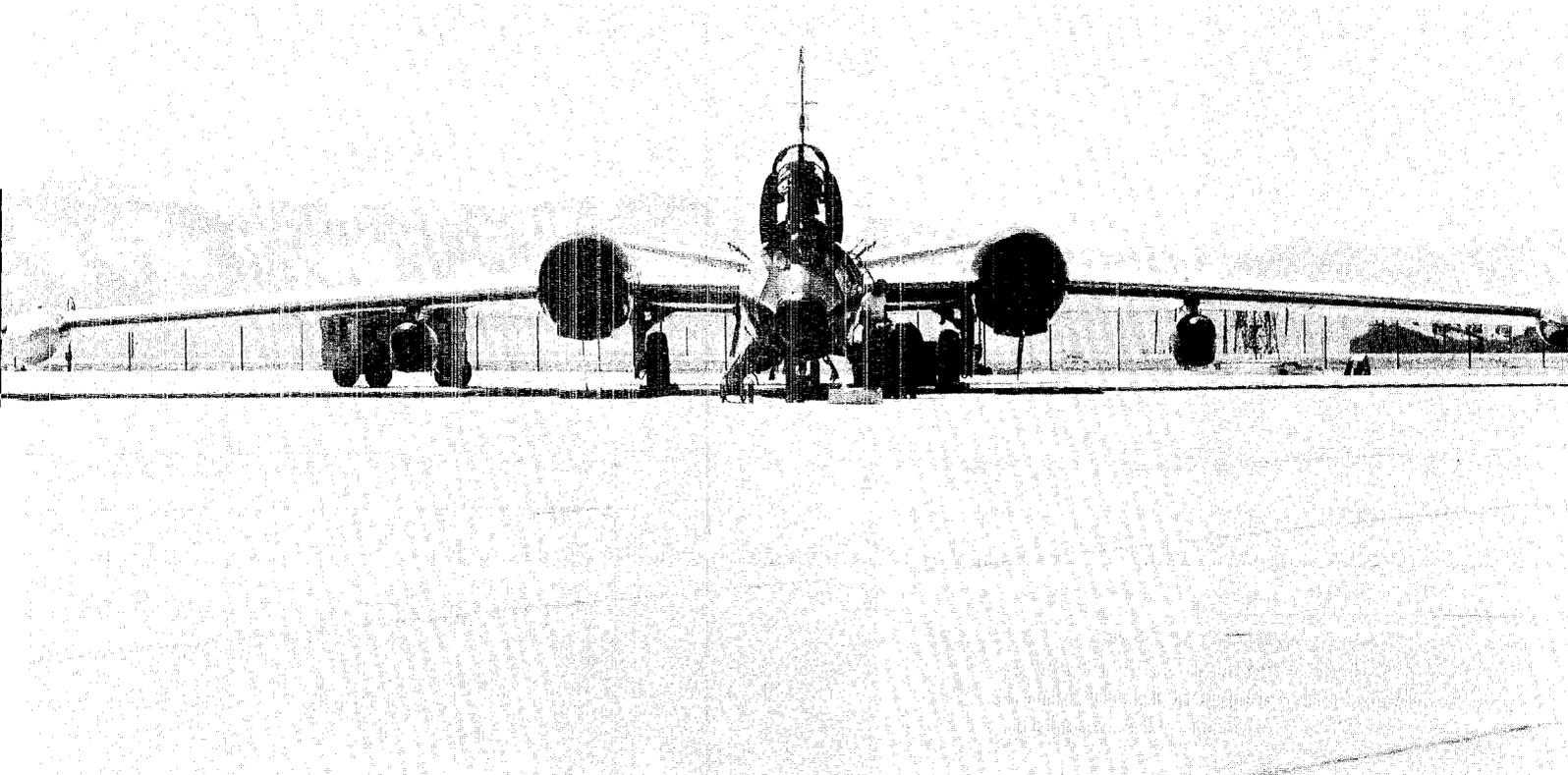
George Saunders, H-6, who is developing the ELA serological test, uses electronic system to detect any slight color changes in cellulose-acetate disks treated with enzyme-labeled antibody from a suspect hog. A white to brown color-change would mean that the hog being tested is infected.





The CIAP Connection

One of the Atomic Energy Commission's NC-135 "flying laboratories" awaits second CIAP mission at Kirtland Air Force Base.



The Department of Transportation is sponsoring a bold and extensive program to clear up some uncertainties about the future impact of high-altitude aircraft on our environment. Known as the Climatic Impact Assessment Program (CIAP), it brings together the efforts of many scientists from universities and colleges, and governmental and industrial laboratories from throughout the world. Included are scientists from Technical Groups CNC-11 and J-16 at the Los Alamos Scientific Laboratory who are heavily backgrounded in making atmospheric measurements from high-altitude aircraft.

Uncertainties stem from the fact that there is not much known about the behavior of jet-engine combustion products in the stratosphere where, projections to the year 1990 show, an increasing number of aircraft will be flying. This second layer of earth's atmosphere begins about 30,000 feet above sea level at the poles and about 70,000 feet over the equator. Unlike the troposphere where we live, it is characterized by an almost complete absence of wind and other weather phenomena. In this quiet, foreign matter has been known to remain suspended for periods of time ranging from one to two years.

Scientists have speculated that combustion products from the engines of large numbers of high-flying planes could react with and upset the delicate balance of gases in the lower stratosphere, bringing about some climatic changes on earth. One example concerns the ozone layer in the stratosphere which protects man from exposure to ultra-violet radiation from the sun. There is some evidence that its quantity is somewhat controlled by oxides of nitrogen. Nitric oxide is one of the combustion products of jet-aircraft engines, although it is not known whether increasing numbers of high-altitude aircraft will emit enough of it to have a significant effect on the ozone layer.

Personnel in Groups CNC-11 and J-16 have been involved in measuring and sampling both artificial and natural atmospheric phenomena for many years. Members of both groups were instrumental in a series of high-altitude experiments which laid some of the groundwork for CIAP. This series, conducted over Alaska in early 1971, was to make some basic measurements of the stratosphere and jet exhaust. The goal was to provide some preliminary information relevant to stratospheric behavior and to set the stage for

continued on next page



Some participants in the WB-57F portion of CIAP discuss projected missions. Beginning at left of Paul Guthals, right foreground, LASL technical manager for WB-57F-related activities, is Donald Heath, NASA's Goddard Space Flight Center; Herbert Roeder, Beckman Instruments; John Fedor, NASA's Goddard Space Flight Center; Peter Kuhn and Dennis Wellman, both of NOAA, Boulder; Roger Nelson, New Mexico Institute of Mining and Technology; J. L. Hunerwadel and Phil Goodman, both of Panametrics, Inc.; Joe Breslin, EG&G/LASL; Russell Glenn, CNC-11; C. B. Moore, New Mexico Institute of Mining and Technology; Bill Sedlacek, CNC-11; D. L. Stephenson, E-5; and Cedric Drake, EG&G/LASL.

more meaningful experiments by defining techniques, instrumentation, analytical methods and operational procedures necessary to conduct them.

While some LASL equipment and research is involved in CIAP, duties of CNC-11 and J-16 personnel are, for the most part, of a managerial nature. Group CNC-11 is responsible for five tasks involving WB-57F aircraft flown by members of the 58th Weather Reconnaissance Squadron, at Kirtland Air Force Base in Albuquerque, which is commanded by Colonel Click Smith, Jr. Group J-16 is responsible for the task involving support by an NC-135 "flying laboratory" operated for the Atomic Energy Commission by members of the U.S. Air Force 4900th Test Group, at Kirtland, which is commanded by Colonel Otis Prater.

Of the CNC-11 tasks, Paul Guthals, LASL technical manager for WB-57F-related activities, is responsible for four of them. These deal primarily with planning and managing of all activities involving placement of LASL and DOT equipment

aboard the WB-57F aircraft, and making prototype and instrumentation flights with data-recording equipment on board. Instruments are operated during actual CIAP flights over many parts of the globe by Air Force observers.

LASL equipment being used in the CNC-II portion of the Climatic Impact Assessment Program includes particulate and gas sampling devices and a data-recording system with 29 data channels and one voice channel. The recording system provides experimenters with general reference information such as air temperature, pressure, altitude, indicated air speed and world time.

Including the LASL equipment, modifications have been made to house nearly 20 different instruments in a WB-57F aircraft. Others are a U.S. Air Force particulate sampler, and a whole-air sampler built by the Illinois Institute of Technology Research Center; various devices for sensing water vapor by the National Aeronautics and Space Administration's (NASA) Goddard Space Flight Center, the National Oceanic and Atmospheric Administration (NOAA), Boulder, and Panametric, under contract to the Office of Naval Research (ONR); particle counting devices by NOAA, Boulder, and General Electric, under contract to the DOT's Transportation Systems Center; ozone meters by the National Center for Atmospheric Research (NCAR) and NOAA, Boulder; a device for measuring electric fields by the New Mexico Institute of Mining and Technology and NOAA, Boulder; a nitric oxide detector by Utah State University, NOAA, Washington, and York University, Toronto, Ontario, Canada; devices for measuring ultraviolet radiation by Beckman Instruments, under contract to NASA's Goddard Space Flight Center, and Panametrics, under contract to ONR; a device for measuring infrared radiation by the University of Denver Research Institute; and a system for high-altitude wind and diffusion measurements by the U.S. Air Force Cambridge Research Laboratory.

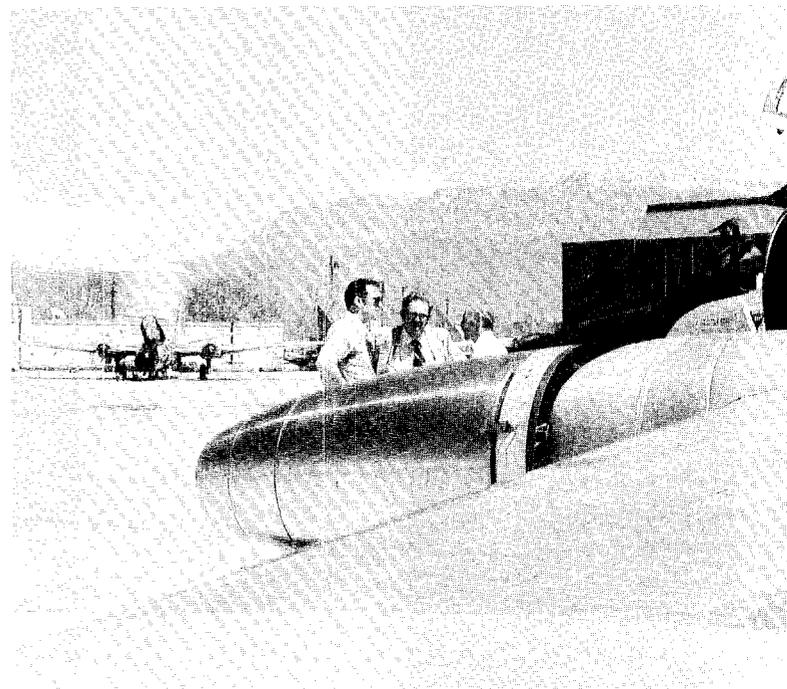
The other CNC-II task is an analytical one directed by Bill Sedlacek. Elemental composition of particulates collected are analyzed using x-ray fluorescence, scanning electron microscopy and neutron activation techniques to complement analysis by NCAR's ion mobility counter.

The J-16 task, directed by Group Leader Robert Peterson, has included two extensive flight series. The primary purpose of these flights was to make measurements of the stratosphere as it presently exists.



Wellman, Kuhn and Goodman examine water-vapor sensor in nose of WB-57F.

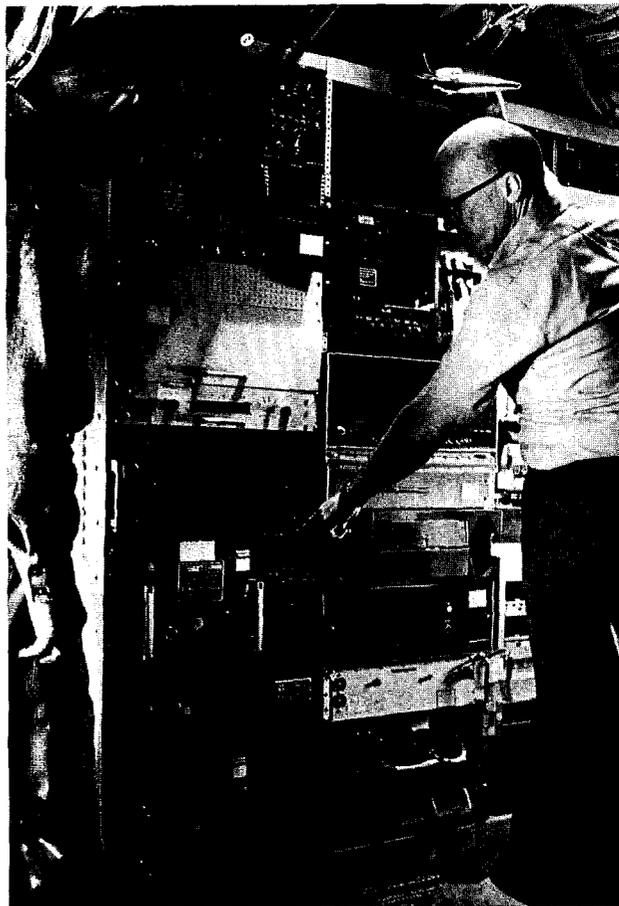
Discussing LASL air-sampling device are Glenn, Goodman and Hunerwadel.



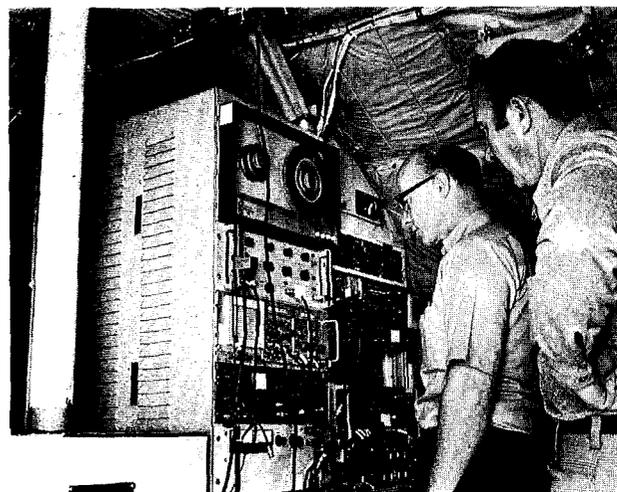
The first flight series, conducted in February and March, provided meridional coverage from the North Pole to the equator by way of Alaska and Hawaii. Numbers and size distributions of stratospheric particulates were measured by NCAR personnel using a lidar system (laser-radar). Experimenters from NOAA, Boulder, used an infrared radiometer to measure the stratospheric water-vapor content, and personnel from the California Institute of Technology's Jet Propulsion Laboratory measured the amounts of many of the stratospheric trace-gas constituents using infrared absorption techniques. It is planned to repeat these meridional measurements periodically to assist in understanding the motion of particulates in the stratosphere and time variations.

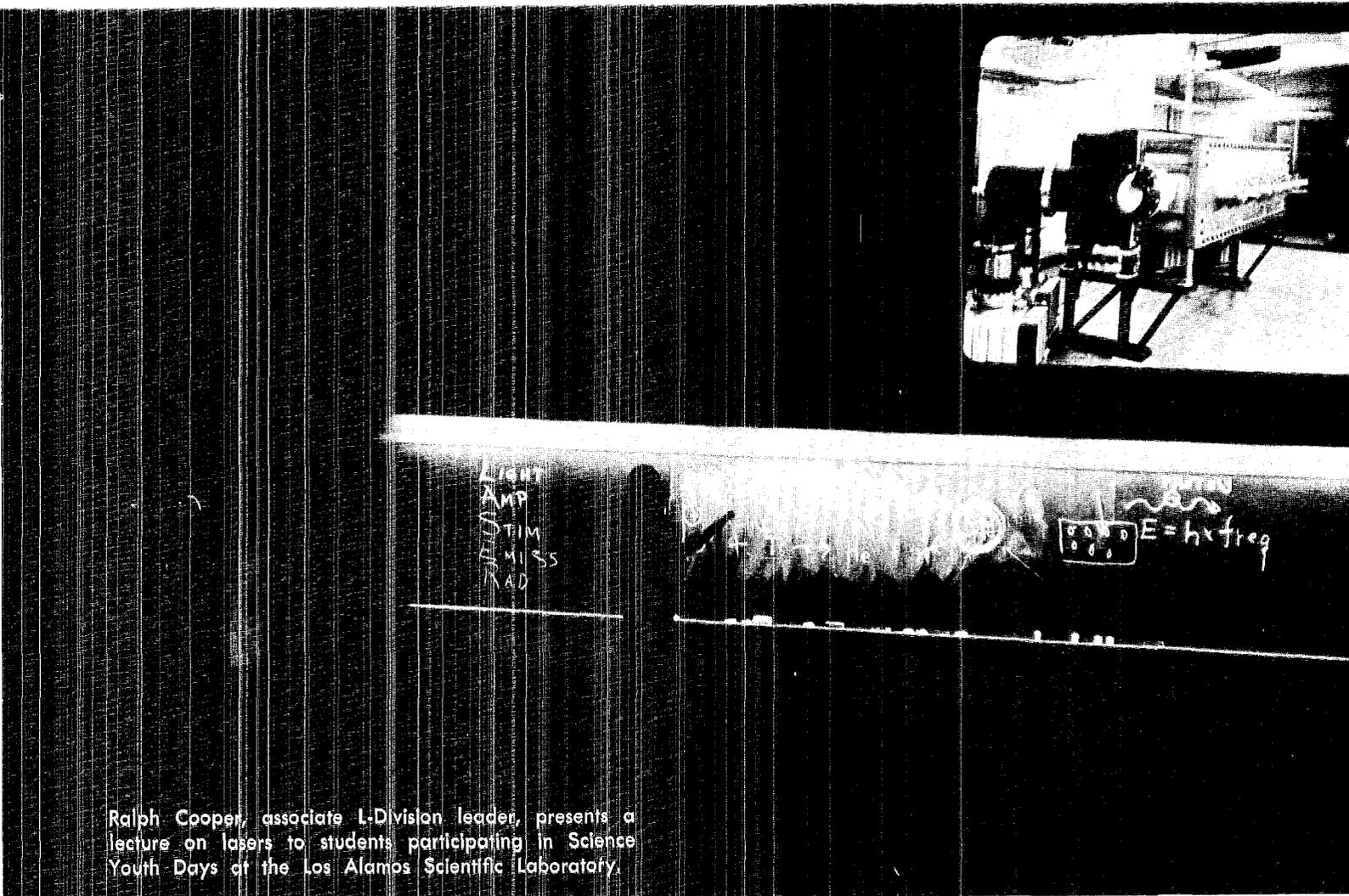
The second NC-135 mission, conducted in April, was designed to obtain similar stratospheric measurements in a region of predicted future high-density, supersonic-transport traffic across the North Atlantic between the United States and Europe. This mission took place over Labrador, Iceland, Spain and the United States. One local flight was flown from Iceland to observe the area of the Helgafell Volcano for possible injection of particulates into the stratosphere. Volcanoes can serve as point sources for particulate injection into the stratosphere for useful studies of particulate motions and lifetimes in the stratosphere. The NCAR lidar was used to measure the vertical distributions of stratospheric particulates, including possible volcano-produced particulates. The NOAA infrared radiometer measured the stratospheric water-vapor content.

The six tasks in which the Los Alamos Scientific Laboratory is involved are a part of the Atmospheric Monitoring and Experiments Subprogram. This subprogram and four others—Engine Emissions, Atmospheric Modeling, Atmospheric Chemical Dynamics, and Analysis, Integration and Assessment—which make up the Department of Transportation's Climatic Impact Assessment Program, are expected to be concluded in 1974. ✖



Above, Earl Rutledge, J-1, and Robert Peterson, J-16 group leader and scientific commander on NC-135 CIAP missions, discuss the aircraft's inertial navigation system which is maintained by Sandia Laboratories. The system is used to navigate the NC-135 and to provide reference information for experimenters. Below, the two LASL men inspect the NCAR lidar system, used to measure numbers and size distribution of stratospheric particulates. Laser beam is transmitted through tube at left.





Ralph Cooper, associate L-Division leader, presents a lecture on lasers to students participating in Science Youth Days at the Los Alamos Scientific Laboratory.

Science Youth Days 1973

Students from about 50 high schools in a six-state area came together at Los Alamos last month to hear lectures by leading U.S. scientists and to tour facilities in connection with Science Youth Days at the Los Alamos Scientific Laboratory.

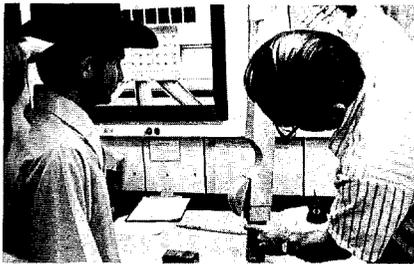
Nearly 1,000 students from New Mexico, Kansas, Texas, Colorado, Arizona and California attended the 16th Science Youth Days at the Laboratory. Co-chairmen for the event were Bob Brashear and Ken Hill, both of Group ISD-2.

Los Alamos High School students participated the first day of the three-day event. A selected number then served as honorary guides for out-of-town visitors the next two days.

Facilities toured included the Health Research Laboratory, Omega Site, Scyllac, Van de Graaff Accelerator Laboratory and the Clinton P. Anderson Los Alamos Meson Physics Facility.

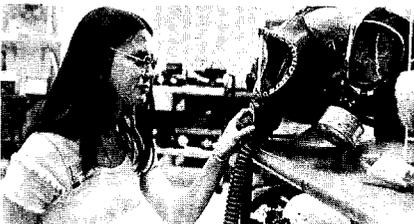


Above, Laboratory Director Harold Agnew welcomes students to Science Youth Days.

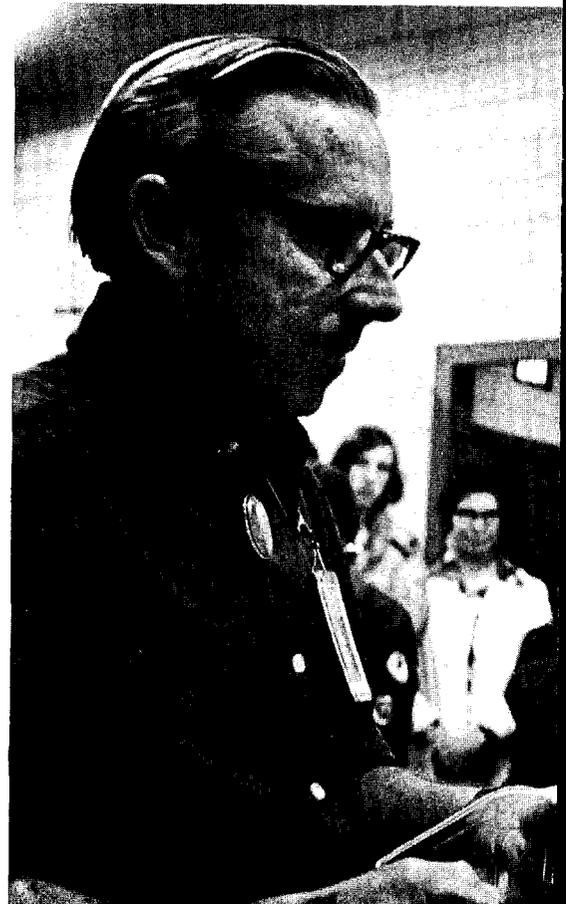


With a mockup, Ed Jurney, P-DO, explains the function of fuel elements in the Omega West Reactor to Rick Barriis, a student from Monte Vista, Colo.

Maureen Maestas, Central, Colo., examines respirators at the Occupational Health Laboratory.



Right, Robin Barthell of Los Alamos holds a laboratory mouse. At left is John Spalding, H-4 group leader.

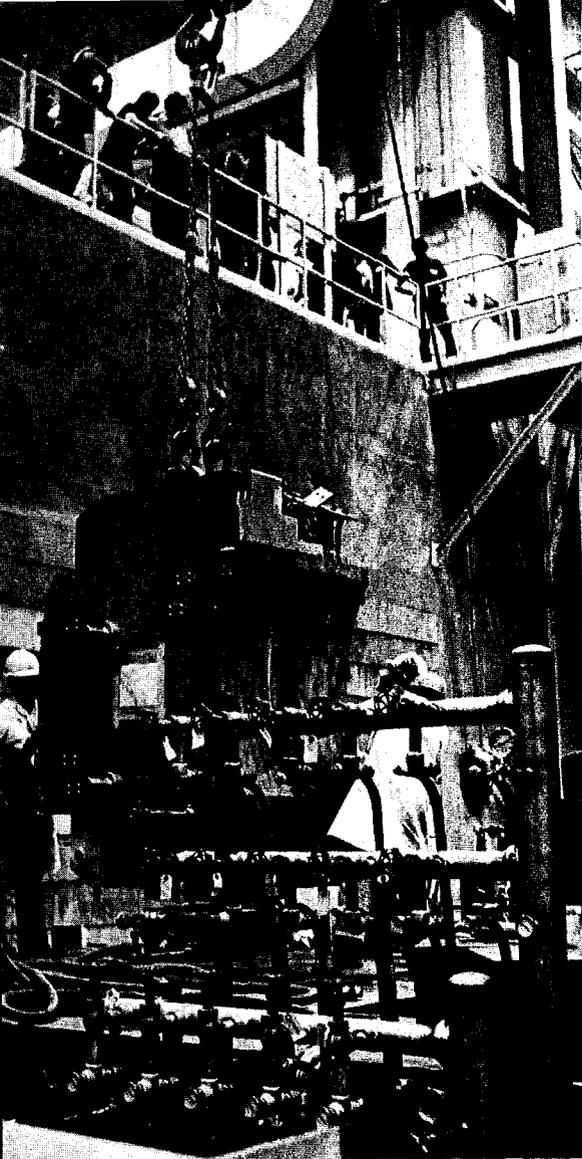




Above, Dieter Hartmann, an honorary guide from Los Alamos High School, and Eddie Rodriguez of El Paso, Texas, right, operate a demonstration program on a graphic terminal computer at the Tandem Van de Graaff Facility. In background are S. J. Schuckman, Hayes, Kans., and David Rivera and Mark Melton, both of El Paso.

Right, Q-3 Group Leader George Sawyer explains to students from Phoenix, Ariz., Scyllac's contribution to experimental work in controlled thermonuclear reactions.





Left, from a balcony, students from Aztec, N.M., watch the installation of a large bending magnet in Experimental Area A at the Clinton P. Anderson Los Alamos Meson Physics Facility.



George Farr and John Whitmore of Los Alamos examine subterranean exhibit following a lecture on the rock-melting device presented by John Rowley, Q-23 group leader.

Below, Ted Hunter, MP-2, shows Christi Rojas and other students from Sierra Grande, Colo., how to operate large manipulator in hot cell at Experimental Area A at the Clinton P. Anderson Los Alamos Meson Physics Facility.



Left, Ed Jurney, P-DO, fields questions at Omega Site from Monte Vista, Colo., students.

Right, Norris Nereson, P-2, explains to students from Los Alamos neutron radiography work done at Omega Site.



short subjects

Gary Tietjen and **Roger Moore**, both of C-5, have won a Frank Wilcoxon Prize, which is presented "... for the best practical application paper published in 'Technometrics' in a given calendar year."

The paper is "An Extension of Some Grubbs-Type Statistics for the Detection of Several Outliers." "Technometrics" is the journal for the American Society for Quality Control and the American Statistical Association. The Wilcoxon Prize, sponsored by the Chemical Division of the American Society for Quality Control is a certificate and \$100.



Marvin Anstey, SD-5, is the 16th Laboratory employee to become a member of the Wise Owl Club.

The club is a non-profit organization sponsored by the National Society for the Prevention of Blindness. Membership is limited to those whose eyesight is determined to have been saved by the wearing of safety glasses.

Anstey's safety glasses were struck by a piece of a broken drill that originated from a nearby drill press being used by a fellow employee. The right lens of Anstey's safety glasses was shattered.



The late **Wright Langham** has been named to his alma mater's hall of fame and will receive an award, posthumously, from the Health Physics Society.

Langham, who was assistant H-Division leader for biomedical research at the Laboratory at the time of his death in May of 1972, has been named to the Alumni Ambassadors Hall of Fame at Panhandle State College, Goodwell, Okla. Langham was graduated from Panhandle State in 1934 and later taught at the college.

Langham will receive the Health Physics Society's Distinguished Achievement Award at the Society's annual meeting, in Miami Beach, Fla. June 20. This award recognizes outstanding contributions to the health physics profession through distinguished achievement in areas such as research, teaching and public service.

"Family Days" at the Los Alamos Scientific Laboratory will be held May 19-20. Admittance is restricted to the immediate families of badge-holders only.



The second edition of the Rio Grande Chapter of the Special Libraries Association's "Dictionary of Report Series Codes" has been published.

Edited by **Lois Godfrey**, assistant ISD-4 group leader, and **Helen Redman**, former group leader, the publication provides bibliographic identification of technical reports.

The first edition, published in 1962 was internationally accepted as the best single source for identification of the hundreds of thousands of technical reports issued since World War II. The second edition is expected to be in even greater demand because of the rate of growth in report literature during the 10 years that have elapsed since the first edition was published.

Reports are, in general, identified by a prefix consisting of a combination of letters and/or numbers and a serial number. The recurrent letters and numbers used as the prefix are often known as the report series code. It is the purpose of the "Dictionary of Report Series Codes" to identify as many as possible of these series codes with the agencies originating the reports or assigning the numbers.

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city _____ state _____ zip code _____

The Santa Fe Board of Realtors, whose approximately 200 members include realtors from Los Alamos, has named **Louis Rosen**, MP-Division leader, "Citizen of the Year for 1972."

Rosen will serve as the Board's nominee for the state Citizen of the Year for 1972 Award, which will be presented in the fall.



The Los Alamos Scientific Laboratory has received the Atomic Energy Commission's Award of Merit for "having completed 2,758,000 continuous injury-free man-hours for the period May 20, 1972, through Sept. 4, 1972."

Joseph Romero, CMB-11, died of injuries received in an automobile accident. In addition to his wife, Josefita, he is survived by three daughters, Linda Mackel, Shirley and Kathy, and three sons, Robert, Kenneth and Roderick.



Abbie Consolino, AO-4, has retired after six years with the Laboratory. She will live in Pittsburg, Kans.

Donald Kincaid, ENG-4, has retired after 16 years with the Laboratory's Engineering Department. He and his wife, Clara, will make their home in Eureka, Mo.

LASL Photographers Win 12 of 17 IPSW Awards

Mitzie Ulibarri, Bob Martin, Eugene Lamkin and Bill Jack Rodgers.



Eugene Lamkin, of Group L-2 at the Los Alamos Scientific Laboratory, won the two highest awards in print competition at the recent 14th Annual Conference of the Industrial Photographers of the Southwest.

Lamkin and three ISD-7 photographers—Mitzie Ulibarri, Bob Martin and Bill Jack Rodgers—won 12 of the 17 awards presented at the conference.

In addition to his Best of Show (On the Job) and Best of Show (Off the Job), Lamkin won first places with the same prints in the Color (On the Job) and Color (Off the Job) categories. He also won first and third places in the Color or Black and White Showing Technical Achievement category.

Ulibarri won first and third places for Black and White (On the Job). Martin was first and second in Black and White (Off the Job), and Rodgers was third. Rodgers won second place in Color or Black and White Showing Technical Achievement.

Ulibarri was elected president of the IPSW. New members of the board of directors include Rodgers, Henry Ortega, ISD-7, and Leroy Sanchez, EG&G at Los Alamos. Billy Claybrook, ISD-7, past president, will also serve on the board.

the technical side

Taken from Technical Information
Release Forms submitted to ISD-6

Seminar, Technical Institute, Zurich, Switzerland, Jan. 9:

"On Measuring the D-State with Polarized Deuterons" by P. W. Keaton, P-DOR

Physics Department Seminar, University of Manitoba, Winnipeg, Canada, Feb. 8:

"Techniques for High Precision Measurements of Polarization Analyzing Tensors" by G. G. Ohlsen, P-DOR (invited)

University of British Columbia, Vancouver, Canada, March 1:

"Particle Physics at LAMPF" by M. M. Nieto, T-5

Symposium on the Anomalous Absorption of Intense High Frequency Waves, Los Alamos, March 1-2:

"Hot Electrons and All That" by R. W. Mitchell and R. L. Morse, both T-6

"Effect of Nonthermal Processes on Neutron Emission in Laser Produced Plasmas" by G. H. McCall, R. P. Godwin and J. F. Kephart, all L-4

"Collisional Transport of Energetic Electrons in a Radiantly Heated Medium" by K. Lee, W. P. Gula and R. L. Morse, all T-6, D. B. Henderson, TD-8, and C. W. Nielson, Q-6

"The Nonlinear Behavior of Backscatter Instabilities in a Bounded Plasma" by D. W. Forslund and J. M. Kindel, both T-6, and E. L. Lindman, J-10

"Measurement of Ion Energy from a Laser Produced Plasma" by W. Ehler, D. Giovanielli and F. Young, all L-4

"Hot Electron Production Associated with the Anomalous Absorption of Microwaves Near the Electron Plasma Frequency" by H. Dreicer, R. F. Ellis and J. C. Ingraham, all Q-1

"Melting Holes in the Earth" by J. C. Rowley, Q-23

Seminar, Physics Department, University of British Columbia, Vancouver, Canada, March 2:

"Resolution of SU(3) Meson Problems by Using the Duffin-Kremmer-Petiau Wave Equation" by M. M. Nieto, T-5

Seminar, Department of Nuclear Engineering, University of New Mexico, Albuquerque, March 2:

"Medical Applications of LAMPF—A Physicist's Viewpoint" by L. Rosen, MP-DO

Colorado State University, Ft. Collins, March 5; Scripps Institute, La Jolla, Calif., March 13; and Chemistry Department, University of California, Los Angeles, March 14:

"Carbon-13 NMR Spectroscopy of Labeled Biological Systems" by N. A. Matwiyoff, CNC-4 (invited)
McMaster University, Hamilton, Ontario, Canada, March 5:

"The History of a Stolen Idea: The Titius-Bode Law of Planetary Distances by M. M. Nieto, T-5

Seminar, Division of Biomedical and Environmental Research, U.S. Atomic Energy Commission, Washington, D.C., March 5:

"The DNA-Dependent RNA Polymerase: I. Effects of X-Irradiation on the Process of *In Vitro* RNA Polymerization; II. Induction of Stable Complex Formation between Enzyme and Template by Ultraviolet Light" by G. F. Strniste, H-9 (invited)

Laser Fusion Meeting, Bendix Corporation, Kansas City, Mo., March 5-6:

"Laser Fusion: Prospects and Problems" by R. Pollock, Jr., TD-DO
1973 Particle Accelerator Conference on Accelerator Engineering and Technology, San Francisco, Calif., March 5-8:

"Mechanical Design of the LAMPF Low-Energy Pion Channel" by R. L. Fulton, MP-7

"The Satellite Minicomputer—A Practical Solution to Accelerator Control" by D. R. Machen and J. M. Potter, both MP-1

"The Central Control Room Man-Machine Interface at the Clinton P. Anderson Meson Physics Facility" by B. L. Hartway, C. M. Plopper, both MP-1, and J. Bergstein, MP-2

"Density Profiles of a Supersonic Jet Target" by J. E. Brolley, P-DOR

"Proposed Accelerator for Heavy Ions" by R. H. Stokes, P-12

"Design and Measured Characteristics of Minimum Loss Low-Velocity Helix Resonators" by P. J. Bendt, B. H. Erkkila and R. H. Stokes, all P-12

"The Expanding Role of the

Small Van de Graaff in Nuclear Nondestructive Analysis" by A. E. Evans, A-1

"Operating Results on the 800-MeV Proton Linac at the Los Alamos Scientific Laboratory" by D. C. Hagerman, MP-DO

"A Compact Programmable Control Panel for Computer Control Systems" by B. L. Hartway, MP-1

"Digital Filter Design for Accelerator Data and Control Systems" by D. R. Machen, MP-1

Institute of Electrical and Electronic Engineers Meeting, Los Alamos, March 6:

"Energy and Society" by G. A. Graves, ADRG

Environmental Protection Agency, National Environmental Research Center, Research Triangle Park, N.C., March 6:

"The DNA-Dependent RNA Polymerase: Effects of X-Irradiation on *In Vitro* RNA Polymerization" by G. F. Strniste, H-9 (invited)

McMaster University, Hamilton, Ontario, Canada, March 7:

"Terrestrial and Extraterrestrial Limits on the Photon Mass" by M. M. Nieto, T-5

Northern Illinois University, DeKalb, March 7:

"Analysis of Mammalian Chromosomes by Giemsa Band Staining Techniques" by L. L. Deaven, H-9 (invited)

American Institute of Aeronautics and Astronautics Third Sounding Rocket Technology Conference, Albuquerque, March 8:

"Rocket Experiments in Magnetospheric Physics" by H. M. Peek, J-10 (invited)

Cornell University, Ithaca, N.Y., March 9:

"Particle Physics at LAMPF" by M. M. Nieto, T-5

Explorer Scout Post No. 20, Los Alamos, March 13:

"Monitoring of Surface Water" by W. D. Purtymun, H-8

Sherwood Theory Meeting, University of Texas, Austin, March 12-13:

"Linear Stability Analysis of High Beta Plasmas" by J. P. Freidberg and H. R. Lewis, both Q-6

"Flux-Surfaces for Scyllac Configuration" by J. P. Friedberg, Q-6, and R. E. Stemon, Q-3

"Review of Current Los Alamos Theoretical Work Related to Toroidal Z-Pinch and Belt-Pinch Equilibria Having Diffuse Profiles" by D. A. Baker, Q-6

"Pulsed Theta-Pinch Reactor Burn Code" by T. A. Oliphant, Q-6

"Flushing and Refueling of a Pulsed Thermonuclear Reactor by Means of a Neutral Gas Layer" by T. A. Oliphant, Q-6

"An Implicit, Two-Dimensional, Electromagnetic Plasma Simulation Code" by C. W. Nielson, Q-6, and E. L. Lindman, J-10

"Simulation of a Straight Theta Pinch" by W. P. Gula, T-6

"Kink Instabilities in a High-Beta Tokamak" by J. P. Freidberg, Q-6, and F. A. Haas, visiting staff member in Q-6

"Wall Stabilization in $\iota = 0$ and $\iota = 1$ Systems" by J. P. Freidberg, B. M. Marder, both Q-6, and H. Weitzner, consultant in Q-6

"Stability of a Finite Beta, $\iota = 2$ Stellarator" by J. P. Freidberg, Q-6

"Screw Pinches with Elliptical Cross Sections" by B. M. Marder, Q-6

International Atomic Energy Agency Symposium on Applications of Nuclear Data in Science and Technology, Paris, France, March 12-16:

"The Role of Nuclear Data in the Practical Application of Nondestructive Nuclear Assay Methods" by M. M. Thorpe, A-DO

"Transport of Neutrons Induced by 800-MeV Protons" by R. G. Fluharty, P. A. Seeger, both P-11, D. R. Harris, T-2, J. J. Koelling, ENG-7, and O. L. Deutsch, summer graduate student in P-11

Science Classes, Gallup High School, N.M., March 13; and Des Moines High School, N.M., March 21:

"Cryogenics and Cryogenic Engineering" by F. J. Edeskuty, Q-26 (invited)

Optical Society of America Meeting, Denver, Colo., March 13-16:

"Diffraction and Self-Focusing in the Presence of Saturable Gain and Two Photon Absorption in Laser Amplifiers" by B. R. Suydam, J. C. Goldstein, both T-6, and D. O. Dickman, C-4

"High Power Xenon Laser in the Vacuum Ultraviolet" by W. M. Hughes, R. J. Jensen, both L-3, E. Ault, M. Bhaumik, Northrup Aircraft, Hawthorne, Calif., A. Kolb and J. Shannon, Maxwell Laboratories, San Diego, Calif.

"Polarization in Ice-Crystal Halos and the Origin of the 22° Parhelia" by R. S. McDowell, CNC-4

"Improved Stigmatic Focus of a Czerny-Turner Spectrograph" by J. V. Kline, Colorado School of Mines, Golden, and D. W. Steinhaus, CMB-1

Defense Nuclear Agency Radiation Physics Division Radiation Transport Information Meeting, Washington, D.C., March 15-16:

"The DNA-Sponsored Cross Section Evaluation Program at LASL" by P. G. Young, T-2

Informal Discussions on Direct Energy Conversion, Germantown, Md., March 19:

"Direct Conversion by Means of High-Beta Magnetic Compression and Expansion Cycles" by T. A. Oliphant, Q-6, F. L. Ribe, Q-DO, and T. A. Coultas, Argonne National Laboratory, Ill.

American Physical Society Meeting, San Diego, Calif., March 19-22:

"New Results on the Coexistence of Ferromagnetism and Superconductivity" by R. D. Taylor and D. J. Erickson, both Q-26, W. R. Decker, Western New Mexico University, Silver City, A. L. Giorgi and E. G. Szklarz, both CMB-3, B. T. Matthias, LASL Fellow, and C. E. Olsen, CMB-8

"Lattice Dynamics of Antimony" by R. E. MacFarlane, P-2

"Automation of Trichinella Detection by Physical Methods" by J. D. Seagrave, P-DOR, P. M. Giles and D. M. Holm, both H-6

"A Potential Sensing Technique

for Cell Volume Measurement" by G. C. Salzman, P-DOR, P. F. Mulaney, H-4, and J. R. Coulter, SD-5
"Equation of State in the Mixed-Phase Region" by J. F. Barnes and W. Fickett, both T-4

"Local Exchange-Correlation Potentials in Solids and Free Atoms" by E. A. Kmetko, T-4

Reentry Vehicle Materials Technology Annual Briefing Meeting, Naval Ordnance Laboratory, Silver Spring, Md., March 20:

"REVMAT Graphites from Commercial Raw Materials" by R. J. Imprescia, CMB-8

Interagency Mechanical Operating Group Joining Subgroup Meeting, Kansas City, Mo., March 20-21:

"Electron Beam Weldability of Armco 21-6-9 Stainless Steel" by H. Casey, CMB-6

Planetary Division, American Astronomical Society Meeting, Tucson, Ariz., March 20-23:

"The Intensity and Polarization of the Twilight Sky" by W. Blattner, Radiation Research Associates, Inc., Fort Worth, Texas, and H. G. Horak, J-10

Texas Technological College, Lubbock, March 21:

"The Development of New Energy Sources at LASL" by E. L. Kemp, Q-4

Nuclear Weapon Accident/Incident Response Meeting, Sandia Laboratories, Albuquerque, March 22:

"Current Developments in Monitoring Equipment" by L. J. Johnson, H-8

Department of Physics, University of Arizona, Tucson, March 26:

"High-Energy Short-Pulse Gas Laser Systems" by C. A. Fenstermacher, L-1 (invited)

Physics Department, University of Iowa, Iowa City, March 26:

"Scaling of the Plasma Focus" by R. A. Gerwin, P-7 (invited)

Thirteenth Symposium on Engineering Aspects of Magnetohydrodynamics, Stanford University, Palo Alto, Calif., March 26-28:

"Thrust Stand Performance Mea-

surements of a Lithium Fueled Applied Field MPD Arcjet" by D. B. Fradkin, L-3, and D. J. Roehling, L-1

Physical Electronics Conference, Berkeley, Calif., March 26-28:

"Kikuchi Correlations in Low Energy Electron Spectroscopy" by W. P. Ellis, T. W. Rusch and J. P. Bertino, all CMB-8

1973 Institute of Electrical and Electronics Engineers Meeting, New York, N.Y., March 26-30:

"Magnetic Energy Storage and Its Application in Electric Power Systems" by W. V. Hassenzahl, J. D. Rogers, both Q-26, and T. E. McDonald, E-5

"Nuclear Fusion Using Lasers" by K. Boyer, L-DO

International Conference on Photoneuclear Reactions and Applications, Asilomar Conference Grounds, Calif., March 26-30:

"Coupled Channel Effects in the Alpha Plus Gamma Goes to Deuteron Plus Deuteron Reaction" by B. F. Gibson, V, T-5

"Evidence for Charge-Symmetry Breaking in the Helium Four Plus Gamma Ray to Helium Three Plus Neutron and Helium Four Plus Gamma Ray to Hydrogen Three Plus Proton Reactions" by B. F. Gibson, V, T-5, and G. J. Stephenson, Jr., visiting staff member in T-5

"Two Body Photodisintegration of Helium-3" by B. F. Gibson, V, T-5, and D. R. Lehman, George Washington University, Washington, D.C.

"Photodisintegration of the Trinucleons" by B. F. Gibson, V, T-5

" 4π Detector and Associated Instrumentation for Low Energy Photoneutron and Photofission Measurements" by E. J. Dowdy, G. M. Worth and J. T. Caldwell, all A-2

"Low Energy Photoneutron and Photofission Measurements for ^{232}Th , ^{235}U , ^{238}U , and ^{239}Pu " by J. T. Caldwell, G. M. Worth and E. J. Dowdy, all A-2

"Displacements of Structure in Capture Photon Spectra for Neighboring Photon Target Nuclei" by D. M. Drake, P-3, and I. Halpern, consultant to P-3

International Atomic Energy Agency

Symposium on New Developments in Radiopharmaceuticals and Labeled Compounds, Copenhagen, Denmark, March 26-30:

"Organic and Biosynthesis of Carbon-13 Labeled Compounds for Clinical Investigations" by D. G. Ott, C. T. Gregg, V. N. Kerr, V. H. Kollman and T. W. Whaley, all H-11

Third International Symposium on Toroidal Plasma Confinement, Garching, Germany, March 26-30:

"Plasma Experiments on $\iota = 1, 0$ Helical Equilibria in the Scyllac Toroidal Sector, by W. R. Ellis, F. C. Jahoda, W. E. Quinn, G. A. Sawyer and R. E. Simon, all Q-3

Tenth Symposium on Biomathematics and Computer Science in the Life Sciences, Houston, Texas, March 28-31:

"Detection of Outliers in Linear Regression" by G. L. Tietjen and R. J. Beckman, both C-5

Aerospace Corporation, Los Angeles, Calif., March 28:

"Laser Fusion" by K. Boyer, L-DO

Northwest Scientific Association's 46th Annual Meeting, Whitman College, Walla Walla, Wash., March 29-31:

"A Pulsed NMR Experiment to Study Residual Entropy in ^{13}CO " by W. L. Barrett, Western Washington State College, Bellingham, and E. Fukushima, CNC-4

Physics Colloquiums, Indiana University, Bloomington, March 30; and Iowa State University, Ames, April 2:

"Lasers—A Path to Fusion Energy" by R. P. Godwin, L-4

Valle del Norte Veterinary Medical Association Meeting, Santa Fe, March 30:

"The Treatment of Neoplastic Lesions by Radio-Frequency Induced Thermal Energy" by J. D. Doss, MP-3

Physics Department Seminar, Massachusetts Institute of Technology, Cambridge, March 30:

"Experiments on Laser-Produced Plasmas" by G. H. McCall, L-4 (invited)

10



years ago in los alamos

Culled from the May, 1963, files of the LASL News and the
Los Alamos Monitor by Robert Porton

Science Fair Students Visit LASL

The Los Alamos Scientific Laboratory was host to over 500 student exhibitors during the 1963 National Science Fair at Albuquerque. The visiting students toured several technical areas. LASL is one of the Fair's sponsors. Twelve Los Alamos scientists were among the 158 judges from 34 medical, educational, military and scientific organizations who judged the 14th Science Fair International. The Laboratory, in addition, sponsored a scientific exhibit during the exposition.

Drummer Gets the Beat

Who dumped the drummer? Police had a minor mystery on their hands when they answered a call from a young woman attending a dance at the Recreation Hall. The caller said someone had just slugged the drummer of the band playing for the dance and he was "out cold." Sure enough, he was! But, investigating officers could not get an identification of the musician's assailant. In disgust, a terse entry was made on the daily police blotter, summarizing the incident: "No one knew nuttin."

Sublet Housing is Urgently Needed

An urgent plea for houses to sublet through the summer has been issued by the LASL Personnel Department. A number of graduate students and staff members hired on a temporary basis for the summer months will require family housing and according to a Personnel Department spokesman, "Sublets are harder than ever to get this year."

Bye Bye Bayo Site

How do you clean up an entire canyon after it has been littered with radioactive debris, scattered about by high explosives over the past 18 years? This problem arose at Los Alamos this month when the Laboratory decided to abandon its Bayo Canyon Site and restore the area to its natural condition. The AEC hired 26 men from the Jemez and Zia Indian Pueblos to do the job. During the first ten days, the men picked up 20 truck loads of debris which were hauled away and buried. Buildings are being torn down and burned. Ashes are being buried deep underground. Bunkers will be removed by first cracking them apart with dynamite.

what's doing

BIEN DICHO TOASTMASTERS CLUB:
Luncheon meeting, 12:05 p.m., Mondays, South Mesa Cafeteria. For information, call Beverly Wellnitz, 662-4982.

SIERRA CLUB: Luncheon meeting at noon, first Tuesday of each month, South Mesa Cafeteria. For information call Betsy Barnett, 662-9581.

RIO GRANDE RIVER RUNNERS: Meetings at noon, second Friday of each month at South Mesa Cafeteria. For information call Jon Cross, 662-9463.

SPORTS CAR CLUB DEL VALLE RIO GRANDE: Meetings, 7:30 p.m., Hospitality Room, Los Alamos National Bank, first Tuesday of each month. For information call Hunter Hill, 672-9550, or Wayne Fullerton, 662-4171.

PUBLIC SWIMMING: High School Pool — Monday through Wednesday, 7:30 to 9 p.m.; Saturday and Sunday, 1 to 6 p.m. Adult swim club, Sunday, 7 to 9 p.m.

MESA PUBLIC LIBRARY:

April 24-May 14 — Display, "Spring Cleanup and Keep America Beautiful," Los Alamos High School Ecology Group
April 23-May 21—Kirk Tatum, prints and paintings

May 15-June 5—Leslie Armstrong, craft display, "Toadstools."

May 17—Book discussion, 1:45 p.m., Anne Warren, on "Becoming Partners," written by Carl Rogers

May 30—Book Discussion, 1:45 p.m., Jim Brown, on "The Quest," written by Claudio Naranjo

MOUNTAIN MIXERS SQUARE DANCING CLUB: Mesa School, 8 p.m. For information call Ruth Maier, 662-3843.

May 5—Charles Hartley, Roswell

May 11-12—State Festival, Portales

May 19—Dick Sievenforcher, Albuquerque

NEWCOMERS CLUB: May 23, Peddler's Market, White Rock Community Building, 7:30 p.m. For information call Pat Astel, 662-4709.

LOS ALAMOS OUTDOOR ASSOCIATION: No charge, open to the public. Contact leaders for information.

May 5—Downriver Marathon Race, Espanola to Otowi Bridge, John Sullivan, 662-6185

May 6—Otowi Bridge Beginner's Race, Harriett Martin, 662-6451

May 12—Hike to Ancho Rapids, Joe Devaney, 662-5658

May 12—Rio Grande Slalom, Pilar, Jon Cross, 662-9462.

May 13—Canoe Poling Race, Pilar, Cecil Carnes, 672-3593

May 13—Rio Grande Downriver Race, Pilar, Stretch Fretwell, 662-6477

May 19—Pilar Race Course, decked hard-boat workshop, Walter Green, 672-3203

May 26-28—Canyon de Chelly, John Kirkpatrick, 662-2734

May 26-28—Dolores River, Colo., Walter Green, 672-3203 and Jon Cross, 662-9462



Chet Richmond, alternate H-Division leader at the Los Alamos Scientific Laboratory, confers with Emilio Iranzo and M. D. Bruner. Iranzo is chief of the radiological protection section of the Junta de Energia Nuclear—Spain's equivalent of the United States Atomic Energy Commission. Bruner is special assistant to Dixy Lee Ray, chairman of the United States Atomic Energy Commission. Iranzo and Bruner discussed areas of mutual interest with Laboratory personnel, particularly in the areas of radiobiology and plutonium.

Henry T. Motz
3137 Woodland
Los Alamos, New Mexico 87544

University of California Regents Mrs. Edward Heller, Allan Grant, Glenn Campbell and Chairman Dean Watkins, a former LASL staff member, listened to Del Harbur, left, CMB-11, describe techniques for encapsulating ultrapure, medical-grade plutonium-238, which is used to power prototype heart pacemakers. A delegation of regents and officials of the University visited LASL for briefings on Laboratory projects and programs. The group toured DP Site and the Clinton P. Anderson Los Alamos Meson Physics Facility.

